

Particle Identification Algorithms Based on Machine Learning for STCF

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The Super Tau-Charm Facility (STCF) is a new generation e^+e^- collider designed for various physics topics in the τ -charm energy region. The particle identification (PID), as one of the most fundamental tools in physics analysis, is crucial for achieving excellent physics performance. In this work, we present a powerful PID software based on ML techniques, including a global PID algorithm for charged particles combining information from all sub-detectors, a deep CNN taking Cherenkov detector inputs to discriminate charged hadrons, as well as a deep CNN discriminating neutral particles based on calorimeter responses. The preliminary results show the PID models has achieved excellent PID performance, greatly boosting the physics potential of STCF.

Alternate track

1. Computing, AI and Data Handling

I read the instructions above

Yes

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